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03 August 2011

Version of attached file:

Published Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Pearson, M.P. and Chamberlain, A. and Craig, O. and Marshall, P. and Mulville, J. and Smith, H. and Chenery, C. and Collins, M. and Cook, G. and Craig, G. and Evans, J. and Hiller, J. and Montgomery, J. and Schwenninger, J.L. and Taylor, G. and Wess, T. (2005) 'Evidence for mummification in Bronze Age Britain.', *Antiquity*, 79 (305). pp. 529-546.

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Evidence for mummification in Bronze Age Britain

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Ancient Egyptians are thought to have been the only people in the Old World who were practising mummification in the Bronze Age (c. 2200–700 BC). But now a remarkable series of finds from a remote Scottish island indicates that Ancient Britons were performing similar, if less elaborate, practices of bodily preservation. Evidence of mummification is usually limited to a narrow range of arid or frozen environments which are conducive to soft tissue preservation. Mike Parker Pearson and his team show that a combination of microstructural, contextual and AMS ¹⁴C analysis of bone allows the identification of mummification in more temperate and wetter climates where soft tissues and fabrics do not normally survive. Skeletons from Cladh Hallan on South Uist, Western Isles, Scotland were buried several hundred years after death, and the skeletons provide evidence of post mortem manipulation of body parts. Perhaps these practices were widespread in mainland Britain during the Bronze Age.

Keywords: Bronze Age, Britain, burial practice, mummification

Introduction – the site of Cladh Hallan

The Western Isles of Scotland – also known as the Outer Hebrides – contain some of the best preserved prehistoric settlements in the British Isles, dating from the Neolithic to

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Received: 24 August 2004; Accepted: 30 January 2005; Revised: 28 February 2005

ANTIQUITY 79 (2005): 529–546

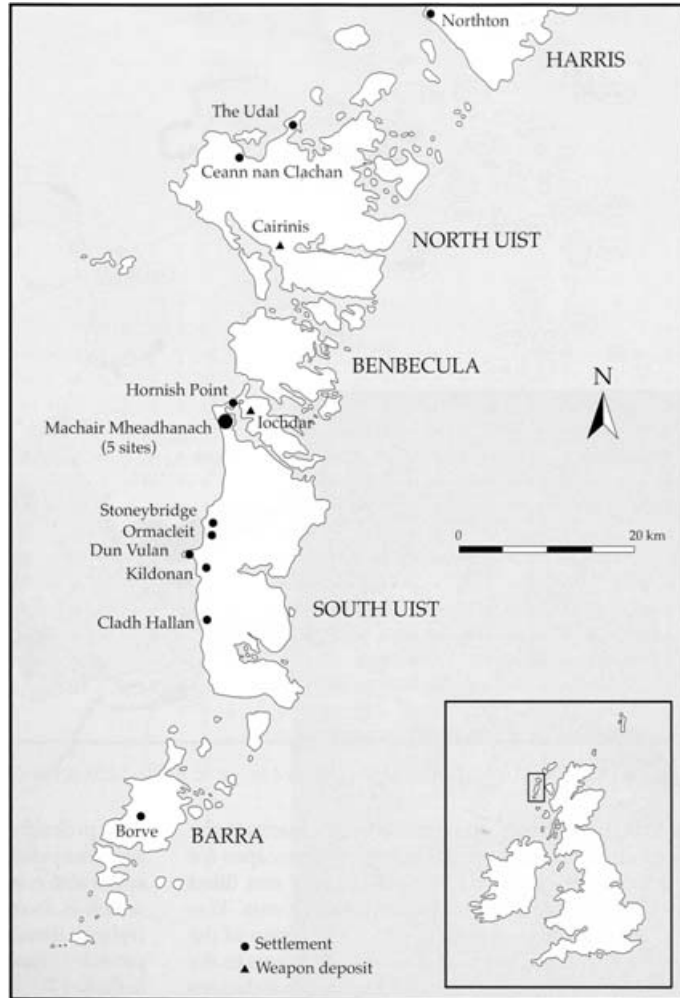


Figure 1. The distribution of Late Bronze Age sites in the southern islands of the Outer Hebrides.

the Iron Age (Armit 1996; Parker Pearson *et al.* 2004). Perhaps the best known of these prehistoric remains are the brochs, stone-walled Iron Age roundhouses, some of which stood over 10m high (Parker Pearson *et al.* 1996). Until recently, little was known of the period before the brochs but archaeological excavations at Cladh Hallan on the island of South Uist (Figure 1) have uncovered an unusually well preserved group of Late Bronze Age to Iron Age roundhouses (*c.* 1100-200 BC). The prehistoric settlement's main feature is a row of four or more roundhouses (Figures 2 and 3), all built as a single structure with party walls (Pitts 2002: 455; Barber 2003: 174-5; Bewley 2003: 90-3; Parker Pearson *et al.* 2004: 64-82).

The houses were constructed as sunken-floored buildings, dug into the calcareous sand (known as *machair* sand) up to 1m below ground level. The northernmost three of these houses were fully excavated; the fourth and possibly further houses to their south remain



Figure 2. Cladh Hallan during excavation in 2000, seen from the north.

preserved within the southern half of the settlement mound. Within the north house (House 1370) were found the burials of two adults and a child, in the central house (House 401) a child and two dogs, and in the southern house (House 801) the burial of one child (Figure 4). Four of these burials, the two adults in the north house (a female, 2613 and a male, 2638) and the children in the central (2727) and southern houses (2792), were placed in the ground before the first floors of peaty sand were laid down. It is these burials, construed as pre-construction offerings, which also gave evidence for the prior mummification and curation of the bodies.

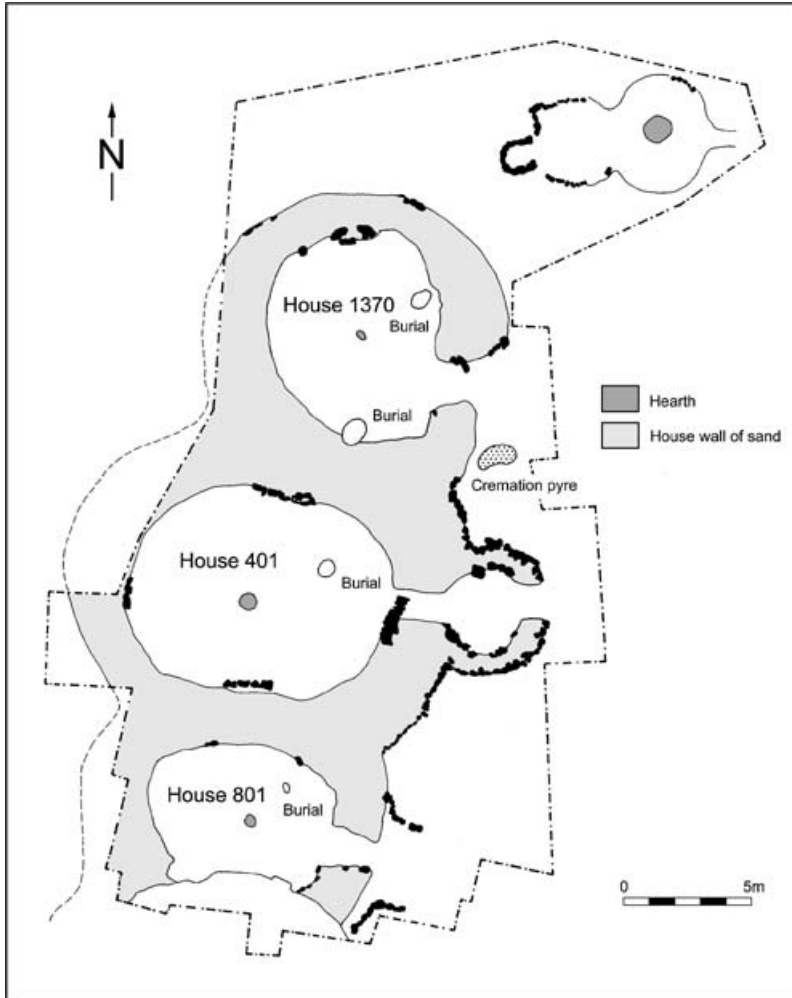


Figure 3. Plan of the row of three roundhouses at Cladh Hallan, with the positions of the four foundation burials. The outlying house to the north-east was built in the later first millennium BC.

The floors of the middle and north roundhouses were unusual in that they consisted of sequences of multiple floor layers interspersed with make-up fills. Whereas the southern roundhouse had filled up with windblown sand on top of its initial floor, the middle roundhouse had eight successive floors with a total depth of 1.3m. This continuous occupation and renovation spanned a period of almost a thousand years from *c.* 1100 BC to *c.* 200 BC, making it an unusually long-lived building. In the north house, the formation and use of two successive floors were followed by a brief period of abandonment (marked by windblown sand) and then the laying of a third floor (accompanied by a re-foundation burial of an infant). The infant was buried at the founding of the north house's third phase of occupation whilst the two dogs, one of them decapitated, were buried beneath the middle house's fourth floor (Figure 4).

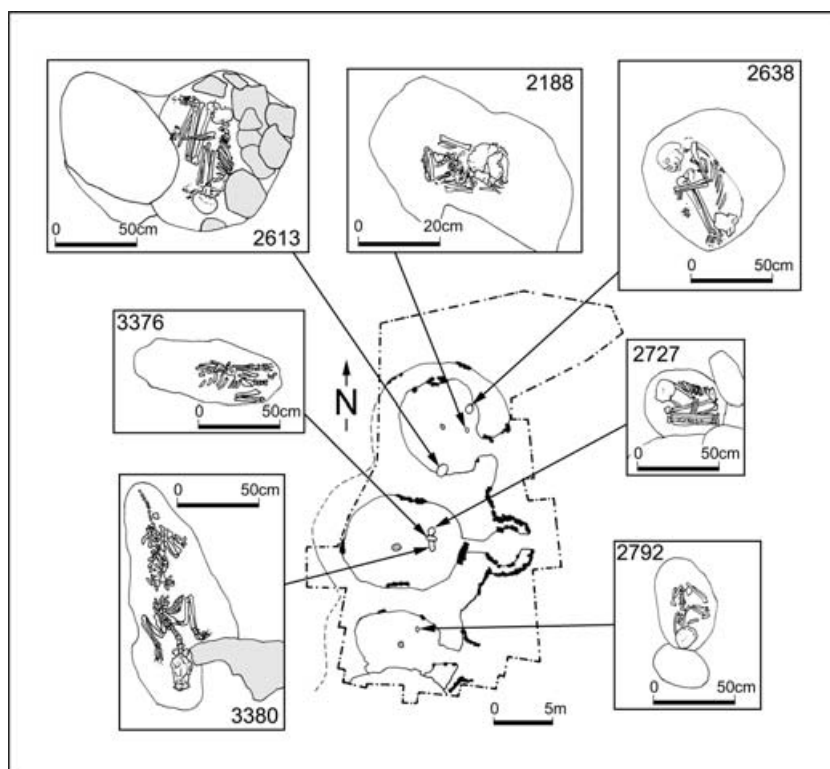


Figure 4. The locations of human and dog burials within the three roundhouses.

The stratigraphic contexts of the burials

The skeletons of the four foundation burials lay within pits whose stratigraphic relationships to the roundhouses in which they are situated are strongly suggestive – but not unequivocally proven to be – of burial at the moment of house construction. The possibility that the bodies were buried as part of a cemetery, long before the roundhouses were erected, has to be considered but is highly unlikely for several reasons. Three of the four burials were located in a specific area of the roundhouses – the north-east quadrants. This association of death with the north-east was not only predicted before excavation began (Figure 5; see Parker Pearson & Sharples 1999: fig. 1. 10c) but was also replicated by the subsequent (Late Bronze Age) burials of the infant and two dogs in the same quadrant within the floor sequences of the middle and north houses. Similarly, a human burial, cut into four and buried with animal bones in four small pits, was found beneath the north-east quadrant of an Early Iron Age roundhouse at Hornish Point at the north end of South Uist (Barber *et al.* 1989; Barber 2002).

The positions of all four foundation burials were marked by informal arrangements of large stones within the lowest house floors of the three roundhouses (Figure 4; nos 2613, 2638, 2727, 2792). In the case of the adult female (2613; Figure 6), the stones were arranged in a protective arc around the back of the burial and were largely covered by the floor layer on top. In the case of the adult male burial (2638), stones from this surface arrangement had

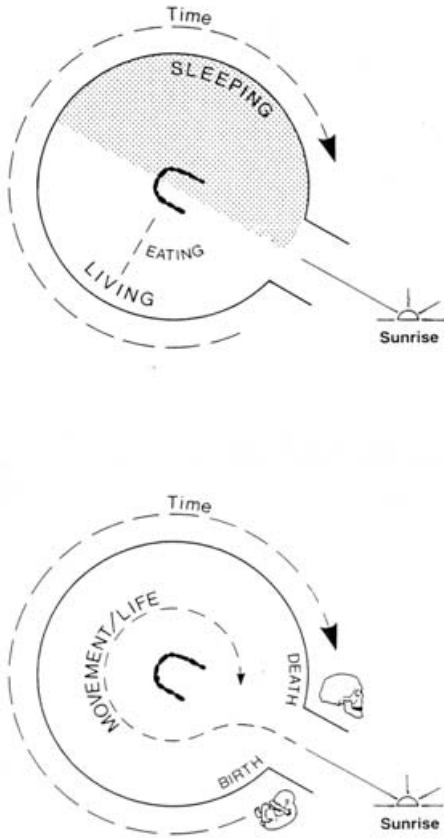


Figure 5. *The predictive model of roundhouse use, drawn in 1996 (from Parker Pearson & Sharpley 1999: fig. 1.6).*

postures as if they had been bound or wrapped, reminiscent of ‘mummy bundles’ from South America and other parts of the world. Their knees were close to their chests and their femurs and lower leg bones were aligned in almost parallel positions. Someone had also handled the remains long after death, making certain alterations to the bodies. The woman’s skeleton (2613; Figure 6) had a full set of teeth except for her two upper lateral incisors which had been removed from her jaw and placed in her hands. The left tooth was placed in her left hand by her head and the right tooth was in her right hand below her knee. Absence of trauma on the two teeth or their sockets suggests that they were removed at some time after death. The male skeleton (2638; Figure 7) was actually composed of bones from three different individuals – the post-cranial skeleton belonged to one man, the head and cervical vertebrae to another and the mandible came from a third. There is no evidence that later material was inserted into an earlier grave; on excavation all skeletal elements appeared in fact to be articulated (see Figure 7). The good definition of layers and boundaries within the machair sand makes it likely that any disturbance or recutting of the pit in antiquity would have been noted during excavation.

slumped into the top of the grave fill (Figure 7 shows the burial after removal of stones). This is consistent with settling shortly after burial and provides good evidence that the grave was dug from the floor of the house (had it been dug much earlier than the house’s construction then post-burial settling would have occurred long before the stones were placed on top and they would not have slumped into the grave). The burial pits of the adult skeletons showed no signs of their having been truncated by the digging down of the sunken house floors.

The stratigraphic sequence thus shows that the circular, flat-bottomed, sunken-floored roundhouses were constructed as a single unit, the burials being inserted from the level of the floor, after the primary wall core of sand had been constructed out of the sandy soil dug out to create this sunken area, and prior to the laying of a thin floor layer of peaty sand.

Evidence for mummification

The two skeletons under the primary floor of the north house (2613 and 2638; Figure 4) were buried in very tightly flexed



Figure 6. *The adult female skeleton.*

These skeletal incompatibilities were revealed by the presence of osteoarthritis on the cervical vertebrae but not on the rest of the spine and by incompatible dentitions – the mandible sported a full set of teeth whereas those of the upper jaw were entirely missing. Whilst the upper front teeth had fallen out post mortem, the upper molars and premolars had been lost through decay or trauma many years before death. Although the mandible was a reasonably good fit for the skull, the lack of calculus deposits on the occlusal surfaces of its teeth further indicates that it had originally belonged to a second individual with a full set of teeth in his upper jaw. The skull was evidently well worn by the time of burial, presumably from abrasion in an above-ground context: erosion of the surface of the maxilla had exposed the vertical facets of the incisor sockets.

The 3 year-old child's skeleton beneath the south house (2792) also appeared to have been buried some time after death; it was entirely disarticulated except for the pelvis and vertebrae. The only one of these four burials with no evidence of post mortem modification was the loosely crouched skeleton of a 10-14 year-old child (probably a girl) under the middle house (2727).

Here were intriguing indications that three of the four bodies might have been preserved for some time after their deaths. But how could we develop a method for finding out whether the dry bones had been held together by soft tissue long after death? There were three available approaches:

- To establish whether the date of death was significantly before the date of deposition of the bodies;



Figure 7. The composite adult male skeleton.

- To determine from the degree of microbial attack on the bones whether soft tissue decay had been arrested after death; and
- To find out if there was any trace of pre-depositional modification of the bones which may indicate the methods of soft tissue preservation that had been employed.

Dating of the skeletons and their contexts of deposition

Comparison of the dates of the adults' and 3 year-old's deaths with their dates of burial provides an indication of the length of the post mortem period during which the three sets of remains were curated. We had expected this period to be too short to be measurable by AMS ^{14}C or OSL methods but the results were surprisingly informative. The moment

of foundation for the house complex (all three house foundations are stratigraphically one event) was dated by optically stimulated luminescence (OSL) applied to the base of the sand core of the shared walls (Table 1). These fall within the period 1250–630 BC. Two radiocarbon dates were obtained from carbonised barley grains within the north house's floor directly on top of (and therefore later than) the burials. They date to 1260–970 cal BC (2915 ± 40 b.p.; GU-10647) and 1390–1110 cal BC (3000 ± 40 b.p.; GU-10648).

Radiocarbon dates were obtained from the undisturbed child's skeleton (GU-9840) and from an adult human scapula fragment (GU-9844) buried within a long stone cist which was partially sealed under the wall core. This latter feature is a probable foundation structure of a type well known from Iron Age Atlantic Scotland and frequently containing human remains (Curle 1944, 1948: 21; Ballin Smith 1994; Parker Pearson & Sharples 1999: 137, 288). These dates are within the same range as the OSL dates, suggesting that these individuals were only recently deceased when buried. If this is the case, then the OSL and AMS determinations indicate a likely date of burial for all individuals (at 95 per cent probability) between 1260 cal BC and 840 cal BC. It is possible to combine the OSL and radiocarbon measurements with their stratigraphic relationships to provide estimates of the dates of the foundation burials and roundhouse construction, using a form of Markov Chain Monte Carlo sampling with OxCal v3.5 (Gilks *et al.* 1996; Gelfand & Smith 1990; Bronk Ramsey 1995, 1998, 2000; Steier & Rom 2000). The model (Figure 8) shows good agreement between the radiocarbon and OSL measurements, and provides an estimate for the start of roundhouse construction of 1330–1100 cal BC (at 68 per cent probability). The end of burial activity (marked by construction of the floor) is estimated at 1100–930 cal BC (at 68 per cent probability). The length of time between the construction of the roundhouses and the laying of the floors that overlie the burials is estimated at 0–60 years (at 68 per cent probability).

In contrast to the dates for initial construction of the roundhouses, the dates for the adult male burial beneath the north house are appreciably earlier. Given the anomalous nature of these burials, the man's skull and tibia and the woman's femur were sampled twice. The pairs of samples give combined dates of 1500–1260 cal BC for the man's skull, 1500–1210 cal BC for the mandible (single date only), 1620–1410 cal BC for his tibia, and 1370–1050 cal BC for the woman's femur. The femur from the largely disarticulated skeleton of the 3-year-old child buried beneath the south house dates to 1440–1130 cal BC, giving a period of death similar to that of the woman buried beneath the north house. However, its enriched $\delta^{13}\text{C}$ value (Table 1) indicates a slightly enhanced marine component to the diet. Whilst this could conceivably cause the child's date of death to appear earlier than it should be, it is probably not enough to make a difference and this child probably died some years, decades or even a century before burial. The 10–14 year-old child buried beneath the middle roundhouse appears, on the basis of her radiocarbon date (2845 ± 50 b.p., 1190–840 cal BC; GU-9840) and absence of post mortem interference, to have died just before her burial.

Determinations of the $\delta^{13}\text{C}$ and C/N ratios indicate that the dates on human bone collagens are otherwise reliable (Table 1). Whilst the human diets were primarily terrestrial (see below), the stable nitrogen (especially those $>+10\text{‰}$) and carbon isotope ratios (especially those $>-20\text{‰}$) indicate that a small marine component cannot be ruled out

Table 1. Dating of Cladh Hallan burials and their contexts

Dated Event	Sample code	AMS ^{14}C age (years BP) or OSL age	Calibrated age range	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	C/N ratio
10-14 year-old Femur	AA-49343 (GU-9840)	2845 ± 50 BP	1190 BC to 840 BC	-22.2	10.6	N/A
10-14 year-old Femur (repeat of AA-49343)	AA-52514 (GU-10490)	2940 ± 40 BP	1290 BC to 1000BC	-21.0	N/A	N/A
Adult scapula fragment (in foundation cist)	AA-48602 (GU-9844)	2865 ± 55 BP	1260 BC to 890 BC	-19.1	5.9	N/A
House foundation (OSL) middle house	CLH02-16	3010 ± 210	1220 BC to 800 BC			
House foundation (OSL) south house	CLH02-12	2990 ± 210	1200 BC to 780 BC			
House foundation (OSL) north house	CLH03-01	2940 ± 310	1250 BC to 630 BC			
Initial occupation (carbonised barley grain) North house	AA-53173 (GU-10647)	2915 ± 40 BP	1260 BC to 970 BC	-25.0	N/A	N/A
Initial occupation (carbonised barley grain) North house	AA-53174 (GU-10648)	3000 ± 40 BP	1390 BC to 1110 BC	-22.7	N/A	N/A
Adult male skull	AA-48606 (GU-9854)	3105 ± 50 BP	1500 BC to 1210 BC	-20.0	10.8	3.4
Adult male skull (repeat of AA-48606)	AA-52379 (GU-10491)	3135 ± 55 BP	1520 BC to 1260 BC	-19.9	N/A	N/A
Adult male mandible	AA-48598 (GU-9838)	3105 ± 50 BP	1500 BC to 1210 BC	-19.9	10.8	3.3
Adult male tibia	AA-48597 (GU-9837)	3305 ± 55 BP	1740 BC to 1440 BC	-19.9	9.9	3.1
Adult male tibia (repeat of AA-48597)	AA-52378 (GU-10488)	3155 ± 60 BP	1600 BC to 1260 BC	-20.1	N/A	N/A
Adult female femur	AA-48599 (GU-9839)	3025 ± 55 BP	1420 BC to 1110 BC	-19.5	11.4	2.8
Adult female femur (repeat of AA-48599)	AA-52513 (GU-10489)	2950 ± 35 BP	1300 BC to 1020 BC	-18.2	N/A	N/A
3 year-old femur	AA-48600 (GU-9841)	3070 ± 50 BP	1440 BC to 1130 BC	-18.8	8.6	N/A

Calibrated using OxCal version 3.8.

N/A = not analysed.

Radiocarbon samples were prepared at the SUERC radiocarbon dating laboratory (GU-code) and measured at the University of Arizona AMS facility (AA-code). OSL samples were dated at the Research Laboratory for Archaeology and the History of Art, University of Oxford.

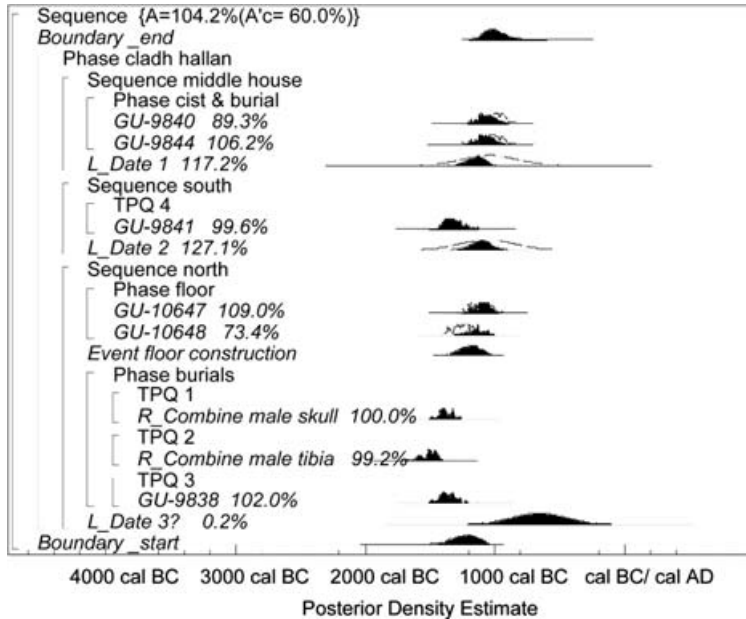


Figure 8. Probability distributions of radiocarbon and OSL dates from Cladh Hallan (calibrated using the atmospheric curve of Stuiver *et al.* (1998)). Each distribution represents the relative probability that an event occurs at a particular time. For each radiocarbon date, two distributions have been plotted: one in outline which is the result of simple radiocarbon calibration (Stuiver & Reimer 1993), and a solid one based on the chronological model used. The other distributions correspond to aspects of the model. For example the distribution 'Boundary start' is the posterior density estimate for the date when house construction started on the site. The large square brackets down the left-hand side and the OxCal keywords define the overall model exactly.

entirely. However, this is unlikely to have affected the dates to any degree (*cf.* Barrett *et al.* 2000). There is some overlap at 95 per cent probability between the dates of the woman's death and her subsequent burial. There is no overlap between the death of the cranial and post-cranial components of the male and his subsequent burial, although the mandible's date indicates a short overlap of 50 years at 95 per cent. It is highly probable that the post-cranial male, if not all three men represented in the skeleton, died centuries before burial, most likely before 1350 BC and probably as early as 1500 BC.

Diet and residence

Strontium, lead and oxygen isotope compositions are all consistent with the woman, the man represented by the mandible, and the 10–14 year-old child having been raised in the Western Isles of Scotland (Table 2). The $^{87}\text{Sr}/^{86}\text{Sr}$ isotope composition of the skeletons' tooth enamel is dominated by a seawater signature and plots within the main field previously obtained for individuals from Lewis (Montgomery *et al.* 2003). The two populations are linked by high Sr concentrations in their tooth enamel which, within UK studies, is a feature so far recorded only in the Western Isles (Montgomery *et al.* 2003).

Table 2. Strontium and lead isotope ratios and concentrations, and oxygen isotope ratios and drinking water values for three of the Cladh Hallan skeletons. Details of analytical techniques for Sr and Pb are given in Montgomery *et al.* (2003). Oxygen isotope methods after O'Neil *et al.* (1994)

Sample No.	Age/ sex	Tooth type	Sr ppm	$^{87}\text{Sr}/^{86}\text{Sr}^a$	$\delta^{18}\text{O}_p^b$	$\delta^{18}\text{O}_{\text{dw}}^c$	Pb ppm	$^{206}\text{Pb}/^{204}\text{Pb}$	$^{207}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{204}\text{Pb}$
CHO1-2316	Adult female	LM2	295	0.709276	16.9 ± 0.3	-5.4 ± 0.6	0.02	17.83	15.42	39.32
		LC1	223	0.709354	17.7 ± 0.2	-3.7 ± 0.5	0.02	18.11	15.47	39.22
CHO1-2638	Adult male	LM2	299	0.709264	16.4 ± 0.2	-6.6 ± 0.5	0.02	17.61	15.50	37.97
CHO1-2727	10-14 year-old	LM2	201	0.709588	16.7 ± 0.6	-5.8 ± 1.2	0.03	18.21	15.41	39.92
		RC1	217	0.709619	17.2 ± 0.3	-4.9 ± 0.7	0.06	18.40	15.50	39.19

^a $^{87}\text{Sr}/^{86}\text{Sr}$ normalised to an NBS 987 value of 0.710240. 2-sigma errors on $^{87}\text{Sr}/^{86}\text{Sr}$ ratio are estimated at $\pm 0.004\%$.

^b Average bone phosphate oxygen.

^c Average drinking water oxygen (conversion from $\delta^{18}\text{O}_p$ to $\delta^{18}\text{O}_{\text{dw}}$ using Levinson *et al.*'s (1987) calibration). In-house reference material enamel – $M \times 2 = 16.2 \pm 0.28\%$ for full procedure during sample analysis.

Oxygen isotope compositions calculated for drinking water (Levinson *et al.* 1987) for the three individuals' second molars are between -5.4 ± 0.6 and -6.6 ± 0.5 with a mean of -5.92 ± 0.58 . The values for the two canines (from the woman and the 10-14 year-old) are slightly higher at -3.72 and -4.89 with a mean of -4.31 ± 0.8 . The somewhat elevated ratios for these earlier formed teeth are consistent with a trophic level shift which occurs during breastfeeding. The drinking water averages for both molars and canines (-5.28) are consistent with modern-day drinking water from the Western Isles (Darling *et al.* 2003).

Finally, Pb isotopes from the tooth enamel are relatively unradiogenic and are consistent with a contribution from ancient crust such as the Lewisian gneiss which is the bedrock of the Outer Hebridean islands. The very low Pb concentrations ($< 1\text{ppm}$) are typical of individuals who predate the use of metal artefacts (Montgomery *et al.* 2005). In summary, all the above evidence points to these three individuals having been native Outer Hebrideans.

Diagenetic analysis of the bones

Evidence for arrested bacterial activity

The discrepancy in dates of the two adult skeletons in comparison to their date of deposition and the evidence of post mortem manipulation raise the possibility of bodily preservation above ground for a long period before interment. The tightly crouched 'mummy bundle' posture of the two skeletons also provides further circumstantial evidence for deliberate mummification. What was now needed was a suite of methods to analyse the skeletal evidence in order to establish whether or not soft tissue preservation occurred and how that tissue might have been preserved.

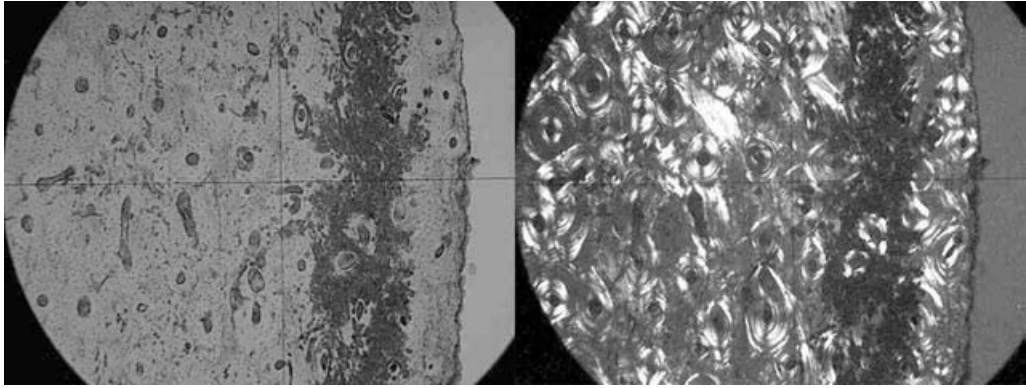


Figure 9. A section through the Cladh Hallan male femur, showing the commencement of microbial alteration, approximately 0.5mm below the periosteal surface. The microbial attack is indicated by dark staining and loss of birefringence under polarised light (right). Usually the decay process is more extensive in a fully putrefied corpse.

To keep a post-cranial skeleton fully articulated for a century or more in a temperate climate requires some preservation of soft tissue (Chamberlain & Parker Pearson 2001). A wrapped body will merely collapse and disarticulate once the muscle attachments and ligaments have rotted. The soft tissues – at least the ligaments and perhaps the skin – could have been preserved in a number of ways, for example by wind-drying, heat-drying, tanning or pickling. For these methods to be most effective, the body must be eviscerated; this entails removal of the internal organs which contain most of the bacteria that initiate decay. We decided to test for this by examining the bone of the male post-cranial skeleton to investigate the process of decay.

Turner-Walker *et al.* (2002) have observed that microbial porosity is typical of intact buried corpses and is much less common in butchered animal remains. From this observation they develop an argument, based upon earlier work by Bell *et al.* (1996), that this microbial attack is caused by collagenolytic gut bacteria entering the bone post mortem via the blood supply. An unusual pattern of microbial alteration in the adult male femur was observed by light microscopy, with dense (budded) microbial attack at the junction between the lamellar and Haversian bone on the periosteal surface and a more diffuse region internal to the endosteal surface (Figure 9). The pattern is both intense and restricted, indicating that there was some initial decay which was then interrupted.

Further evidence for restricted microbial attack was obtained using mercury intrusion porosimetry (HgIP) analysis (Turner-Walker *et al.* 2002). This revealed that the adult male tibia's microbial porosity was unusual. In comparison with the control sample, an articulated dog skeleton buried at the same depth and of approximately the same period, the volume of porosity was less than half. The range in pore sizes for the human tibia was also much less. This supports the interpretation that microbial decomposition was less extreme in the human and was arrested soon after death. Whereas the dog appears to have rotted in its grave as an unprocessed carcass, the trajectory of decay in the man's post-cranial skeleton was curtailed at some point soon after death.

Evidence for the method of soft-tissue preservation

Following evisceration, the soft tissues must have been treated to facilitate their long-term preservation. Our initial expectation was that this would have been achieved by slowly smoking the corpse over a fire, similar to examples recorded in ethnohistorical reports for the Heiltsuk (Bella Bella) of British Columbia (Harkin 1990). However, when the alterations in the bone mineral were examined using Fourier transform infrared spectroscopy (FTIR spectroscopy), it was noticed that the outer section (3mm from the periosteal surface) of the adult male tibia was considerably more altered than the inner section. Mineral alteration of the bone's surface is unusual for bones deposited within the calcareous shell sand of the machair and this alteration is most likely to have occurred prior to deposition in the alkaline machair sand. Whether or not the body was smoked, it was certainly subjected to treatment which caused demineralisation in the bone's surface layers.

The anomalies detected by FTIR spectroscopy were refined by small-angle X-ray scattering (SAXS) (Hiller *et al.* in prep.). Like FTIR spectroscopy, this technique reveals the degree of mineral alteration. However, unlike FTIR, SAXS provides information on the actual dimensions of bone mineral crystallites. In fresh, unaltered human bone, these crystallites are normally 3 to 4nm thick in the smallest dimension, and cannot grow larger than 5nm in non-pathological bone owing to spatial limitation in the bone structure. In the adult human male tibia, the bone crystallites were almost all larger than 5nm, with the thinnest crystallites in the very centre of the bone and the thickest (up to 7nm) at the outer surfaces. These thickness values are not normally observed in non-pathological bone. Nor is the pattern consistent with that of normal post mortem microbial alteration. The results of SAXS were particularly revealing, suggesting that the most extreme mineral alteration lay at or close to the outer edges, but also that the microscopically unaltered bone had suffered slight demineralisation. The U-shaped pattern of alteration is reminiscent of a diffusion-controlled process (*cf.* Hedges & Millard 1995). The shape of crystallites, normally very uniform within an unaltered bone section, showed some evidence of more heterogeneous distribution, particularly in the bacterially damaged areas.

A likely explanation for the pattern of re-crystallisation of the adult male post-cranial skeleton is that it was exposed to an acidic environment for a short amount of time. This must have happened at some point before burial since the remains were found below house floors (and therefore protected from acidic rainwater) within grave fills that are alkaline (with a pH value of 7.2; calcareous machair sand and topsoil are normally within the pH ranges of 7.5-8.0 and 6.5-7.5 respectively (Hudson 1991)). One possibility is the corpse had been preserved in an acid peat bog; prehistoric bog bodies are relatively common in Britain, Ireland and Europe (Turner & Scaife 1995; van der Sanden 1996). People are likely to have been aware of peat's preservative properties, and timbers and other organic remains from earlier periods would have been found whilst digging peats for fuel, as they still are today. Peat was being extracted for fuel from deep cuttings at precisely this time in the Middle Bronze Age on these Hebridean islands (Branigan *et al.* 2002), and experiments on the preservation of piglets (as substitutes for human corpses!) in acid bogs have produced adequate mummification after half a year or so of submersion (Gill-Robinson 1999 pers. comm.).

Was soft tissue preservation widespread in the British Middle Bronze Age?

The research into the Cladh Hallan skeletons has pointed the way to developing a ‘mummy identification kit’ – a methodology for investigating whether and how other human bodies, surviving only as skeletons, were artificially preserved. From the Western Isles, the Hornish Point boy (Barber *et al.* 1989) and a tightly flexed burial inserted into an Early Bronze Age midden at Barvas on the Isle of Lewis (T. Cowie pers. comm.) may be other local examples. Bronze Age burials from mainland Britain include a number whose tightly flexed postures suggested to the excavators that these were ‘trussed’ bodies or were ‘reminiscent of “mummy bundles”’. Published examples include Down Farm (Green 2003: 112–13), Tallington (Simpson 1976: 223) and Dorchester (Smith *et al.* 1997: 78). Inhumation – in contrast to cremation – seems to have been a minority rite in the Hebridean and British Middle Bronze Age and so very few people were given ordinary burial, let alone preservation after death (Burgess 1980: 313–22, Parker Pearson 1993: 101–3). Skeletons with ‘mummy bundle’ postures or other forms of unusual post mortem manipulation form only about one per cent of Britain’s Neolithic and Bronze Age articulated skeletons, and so bodily preservation may only ever have been a minority rite (McIntyre 2004).

The implications of the Cladh Hallan burials

The significance of identifying bodily preservation in the British Bronze Age has nothing to do with Egypt or South America, but points to a locally developed innovation which made best use of available local resources. Mummification might well have secured these select dead people a place in the afterworld but, perhaps more importantly, their preserved bodies would have been available to watch over the living. They were the past personified, the ancestors in embodied form, the guardians of ancient traditions.

From the beginning of the British Bronze Age, individual ancestors seem to have become more important than the collective ancestries of the Neolithic and this new evidence for bodily preservation in the Middle Bronze Age fits in well with these developing notions of individuality after death. This was also a transformative period in Britain’s prehistoric past, between 1600 and 1000 BC, when landscapes dominated by the places of the dead – barrows and cairns – were replaced by ‘landscapes of the living’ filled with houses, settlements and field systems. This change is particularly evident at Cladh Hallan around 1100 BC when these mummified, ancestral dead were deliberately buried within the solid and imposing roundhouses which marked a significant change from the small and ephemeral houses of the Earlier Bronze Age (Parker Pearson *et al.* 2004: 48, 61–4). The care with which the two adult skeletons were interred under the north house is suggestive of a formal and respectful removal from the world of the living. If the power of the ancestors was now being replaced by ideological and cosmological concerns which were manifested in domestic architecture (Fitzpatrick 1994, 1997; Hingley 1995; Hill 1996; Parker Pearson 1996, 1999; Oswald 1997) – the domestication of ritual life (Bradley 1998: 147–64; Brück 1999) – then this moment of burial of preserved bodies as foundation deposits beneath at least one of the houses may represent a fundamental religious transformation in island life when the old

beliefs gave way to the new, not through their total rejection but by their incorporation into the very foundations of the new.

Mummies continue to fascinate. We may be looking at the tip of the iceberg, failing to realise that artificial mummification was far more widespread in prehistoric societies than hitherto realised. The implications of the Cladh Hallan discovery are not simply that British Bronze Age funerary practices were more drawn out and sophisticated than previously thought. It also makes us realise that these prehistoric people had well-developed concepts of long-term ancestry and 'history', embodied literally in the people of an ancient past. Until we develop methods and means of dating the moment of *burial* as potentially different from the moment of *death* and of identifying the arrest of tissue decay and how it was done, we will continue to underestimate these important aspects of Bronze Age life and death.

Acknowledgements

We wish to thank Historic Scotland for funding the Cladh Hallan project and October Films and the BBC for part-funding this aspect of the project, principally the mercury porosimetry, stable isotope analysis and FTIR analysis. Permission for excavation was given by South Uist Estates and Uist Builders Construction whilst the South Uist Historical Society was supportive of the project. We also thank the many volunteers and students of Sheffield University, Bournemouth University, Cardiff University, Southampton University and King Alfred's College, Winchester, who have worked on the project, particularly the team of 2001 who excavated the skeletons. Without their hard work we would never have reached the lowest layers of the site! Figures 1 and 4 were drawn by Irene de Luis. Figure 3 was drawn by Ian Dennis, Figure 5 was drawn by Adrian Chadwick, and Figure 1 was redrawn by the McDonald Institute. JH and TW are grateful for the support of J. Weir in data collection on the NanoSTAR apparatus, and acknowledge the support of SHEFC and Biodermis Ltd, under the Joint Research Equipment Initiative, for the purchase of the NanoSTAR.

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